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(71) Applicant

Motor Panels (Coventry)

Limited,

(United Kingdom),

Holbrook Lane,

Coventry,
CV8 4AW

(72) Inventor

Merrick Wentworth
Taylor(74) Agent and/or address for
serviceBarker, Brettell and
Duncan,

138 Hagley Road,

Edgbaston,

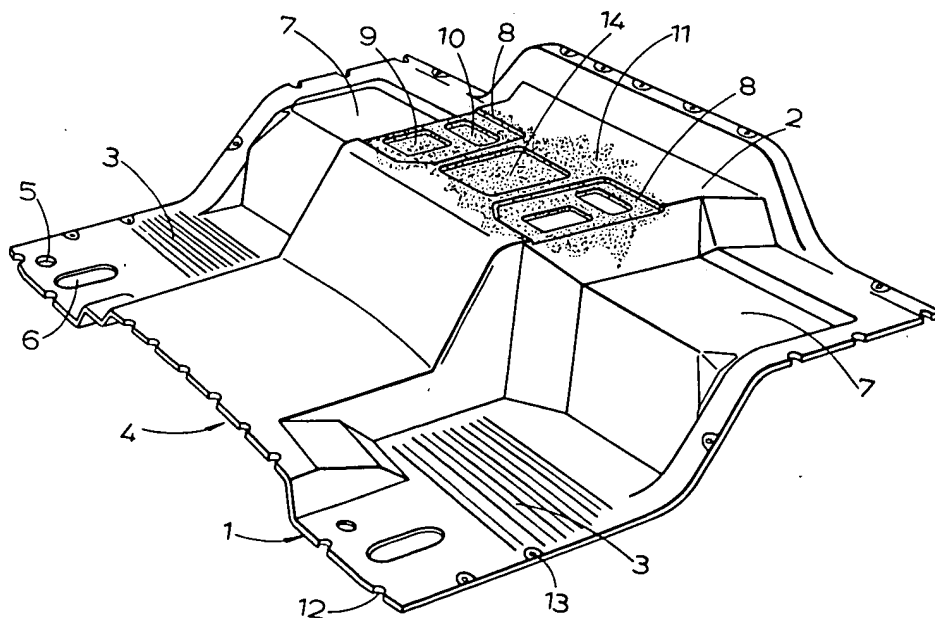
Birmingham,

B16 9PW

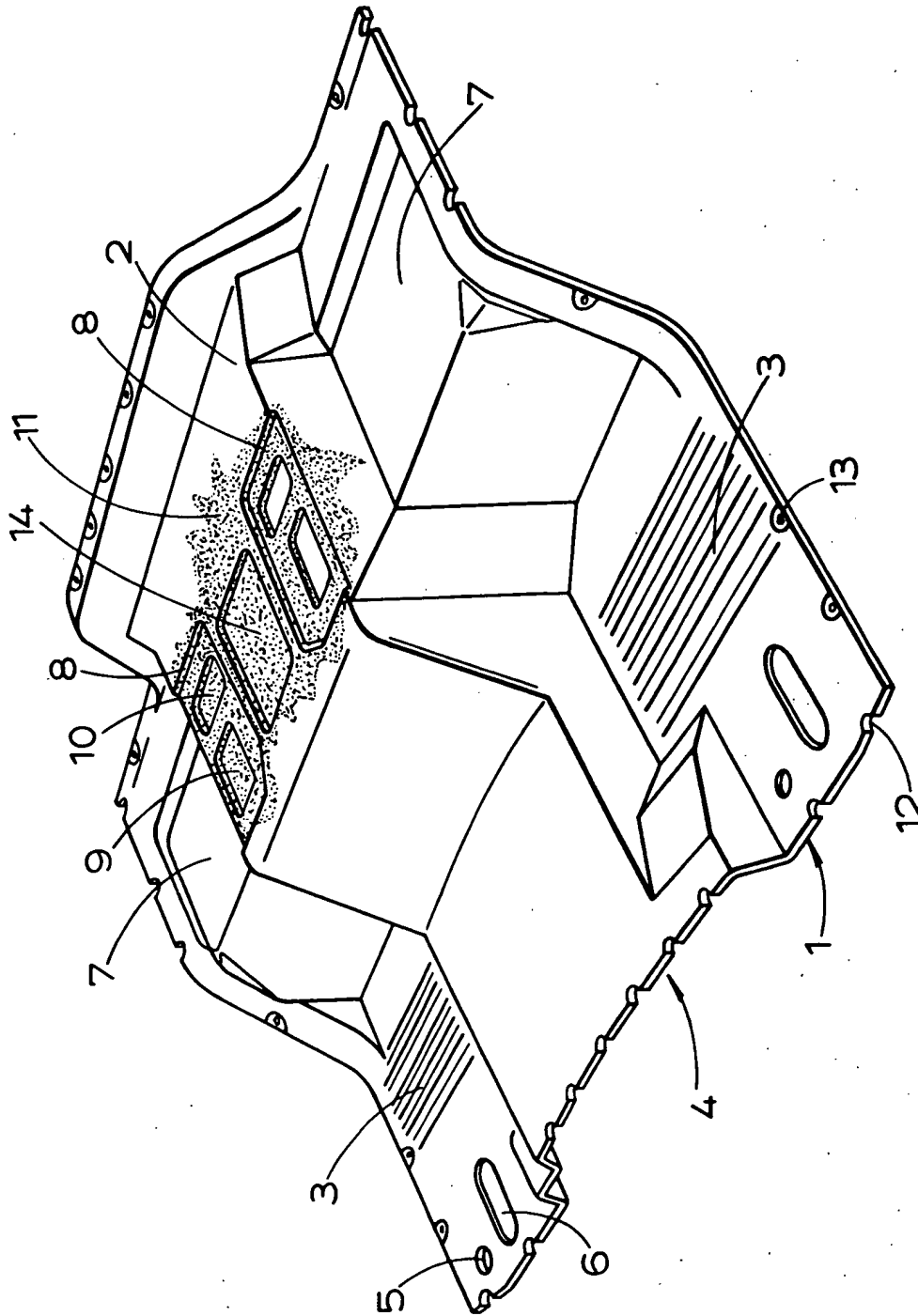
(54) Vehicle cab floor

(57) A vehicle cab floor is made as a one-piece plastics moulding having an abrasion resistant upper surface incorporating a trim effect which simulates trimming, for example the ribbing of a conventional rubber mat

used in vehicle trimming. The preferred floor moulding comprises in succession a first layer of polyurethane, preferably of dense closed cell formation, which provides the abrasion resistant upper surface, a layer of synthetic fibre reinforced resin, a second layer of polyurethane and a second layer of synthetic fibre reinforced resin. The floor includes a raised central tunnel portion 2, lower portions 3 at opposite sides to accommodate the feet of a driver and passenger and having abrasion and slip resistant surfaces, raised portions 7 for seats, openings 5, 6 for an accelerator actuator and steering column and depressions 9, 10 in which apertures may be made selectively for access to wiring harness and for a gear change lever to pass through.



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SPECIFICATION

Floor for vehicle cab

This invention relates to vehicle cabs and, more particularly, to floors for vehicle cabs.

- 5 A vehicle cab floor generally has a raised central tunnel portion which fits over the engine. To either side at the front there is a lower portion to accommodate the feet of the driver and his mate or passenger. Centrally across the front the floor is raised to clear the engine cooling radiator and header tank. There is often provision to allow control pedals and a gear lever to be fitted on either side to suit right and left hand drive versions of the cab. Towards the rear there is a raised portion on either side on which the seats are mounted. The floor may also have to be shaped to clear the rear wheels of the vehicle. The resulting cab floor is of a very complex shape. Conventionally, this is built up from a substantial number of individual metal panels and pressings. These are welded together to form sub-assemblies and the sub-assemblies are welded together to form the floor. The floor is then fitted to a cab frame structure and welded in situ. Part, or the whole, of this floor may be double skinned to provide additional rigidity and sound damping. It has also been proposed to fabricate a cab floor from a number of moulded plastic panels which are bolted together and the assembled floor is fitted to a cab structure and bolted, or bolted and glued, in situ. These known cab floors require considerable labour in their fabrication and, furthermore, subsequently require the fitting of trim such as rubber mats and or carpeting so as to provide a satisfactory finish from the points of view of safe operation, appearance and sound and heat insulation.

According to a first aspect the present invention consists in a vehicle cab floor moulded in one piece from plastics material wherein the finished moulding has an abrasion resistant upper surface incorporating a trim effect as hereinafter defined.

According to a second aspect the present invention consists in a method of making a vehicle cab floor comprising the steps of applying a release agent to the exposed surfaces in a mould for the floor, followed, in succession, by a first layer of polyurethane which provides an abrasion resistant upper surface of the moulded floor, a first layer of synthetic fibre reinforced resin, a second layer of polyurethane and a second layer of synthetic fibre reinforced resin and curing the resin, wherein at least one surface is provided in the mould at a desired location adapted to impart to the first layer of polyurethane at that location a required surface trim effect as hereinafter defined.

This invention also includes a vehicle cab fitted with a cab floor according to the first aspect of the invention, or fitted with a cab floor made by the method according to the second aspect of the invention.

The term "trim effect" as herein used is intended to mean a surface effect which

65 simulates trimming. For example, the surface may incorporate ribbing to simulate the ribbing of a conventional rubber mat used in vehicle trimming or indeed any other pattern of surface effect. Different surface effects may be applied to different parts of the cab floor.

70 An embodiment of the invention will now be described by way of example with reference to the accompanying drawing which is a front perspective view from above of a cab floor made as a one-piece moulding.

Referring to the drawing, a cab floor 1 has a raised central tunnel portion 2 which is shaped to fit over the engine of a vehicle to which a cab in which the floor is incorporated for use is fitted. To either side of the tunnel portion 2 the floor 1 has at the front a lower portion 3 to accommodate the feet of the driver and his mate or passenger. As shown, these lower portions 3 each have a ribbed surface to simulate the tread of a rubber mat. Centrally across the front, at 4, the floor is raised to clear the engine cooling radiator and header tank. On the right hand side (as viewed from the rear of the cab) a hole 5 and a slot 6 are provided through which an accelerator actuator and the steering column of the vehicle respectively can pass.

Towards the rear of the floor on each side, stepped portions 7 are provided onto which the cab seats are mounted. On the tunnel portion 2 depressions 8 are formed which include forward and rear framed portions 9, 10 in which apertures may be defined as required. Such apertures are made on one side of the floor only for access to wiring harness, for example, and for a gear change lever to pass through. A central depression is incorporated for a document tray 14. Outboard of the stepped portions 7 the floor is shaped to conform to the wheel arch of the vehicle to which it is to be fitted.

105 The floor 1 may incorporate on its upper surface a surface effect—such as the stippled effect indicated at 11, or a grained or other pattern effect—to match the interior trim of the cab. The sides of the floor 1 incorporate slots 12 and recessed holes 13 to receive bolts by which the floor is secured, preferably also with adhesive, to the cab structure.

110 In the manufacture of the floor a mould is prepared to give the required shape. A textured lining is applied to it to cause the surface of the moulded floor to take the inverted texture of the lining whereby the desired trim effect is obtained. The mould and lining are treated with a release agent on to which a foamed in situ layer of dense closed cell polyurethane is sprayed, for example to an expanded thickness of the order of 2 mm, to give an abrasion resistant and resilient surface. After setting of the foam a laminate of resin, for example 3 mm thick, reinforced with two layers of woving rovings of glass fibre interleaved with chopped strand mat of 'E' glass, is applied on to the polyurethane. After gelation of this first laminate a further layer of polyurethane is applied to an expanded thickness of, for example, 2 mm,

except over the width of a border, say 70 mm wide around the floor. If desired, a grit may be introduced to, or with the first layer of polyurethane.

- 5 After setting of this second layer of polyurethane foam a second laminate of resin, for example 5 mm thick, reinforced with three layers of woven rovings of glass fibre interleaved with two layers of chopped strand mat is applied. Local reinforcement may be included in the lay up where this is considered necessary or desirable, for example, adjacent control pedals and around openings which are moulded and where openings are subsequently cut in the moulded floor. After curing the floor is removed from the mould. The resin which is used may be of the crystic polyester type with a filler such as molochite (calcined china clay). Suggested proportions by weight are volume of glass molochite and resin in the laminates are as follows:—

	% by weight	% by volume
Glass	38	28
Molochite	23	18
Resin	39	54
25	100	100

to give an overall specific gravity of 1.8.

- When the moulded floor is fitted to a cab it is desirable to provide a watertight and gastight seal. This may be achieved by abrading the underside of the border to expose glass fibres, thoroughly de-greasing this border and abrading and de-greasing the surfaces of the cab to which the border is to be bolted, applying a suitable epoxy resin, for example Araldite (Trade Mark) to the interface and then bolting the floor to the cab structure.

- It will be appreciated that with suitable design of the mould the same mould can be used to make a number of different floors to fit the same cab structure. For example, a different height or shape of tunnel may be required if the vehicle is offered with a choice of engines which are of different heights or shapes. This may be accommodated by designing the mould with loose pieces which are interchangeable in the mould and which will provide different sized and/or shaped tunnels. Similarly, loose pieces can be used for "handling" the cab, that is for right hand or left hand drive.

- Whilst in the embodiment described glass fibre has been used to provide the reinforcement of the resin it will be appreciated that other suitable fibres may be used for the purpose. Carbon fibres may be used, for example. Such fibres are expensive but their use may be justified where their superior strength properties validate such use.

- The one-piece moulded floor made in the manner described reduces the labour content in manufacture. The self finish or trim effect which is incorporated in the manufacture eliminates the need for and expense of trimming the floor of the

- finished cab. Fire resistance of the polyurethane coat is better than that of a rubber mat and underlay. The floor is resistant to chemicals encountered in vehicles and to impact and abrasion. The construction is such that adequate torsional rigidity can be provided. Due to the materials used and their manner of use vibrations are damped and noise and heat insulation are built in. Also, due to the corrosion resistant properties of the plastics material used, there is no requirement for corrosion protection of the undersurface of the floor, as there would be with the conventional steel floor of a cab. The thermal expansion of the floor is compatible with that of steel of a cab structure.

Claims

1. A vehicle cab floor moulded in one piece from plastics material wherein the finished moulding has an abrasion resistant upper surface incorporating a trim effect as herein defined.
2. A vehicle cab floor as claimed in Claim 1 wherein the trim effect comprises an abrasion and slip resistant surface over that region of the floor normally accessible to the feet of a seated driver of the vehicle.
3. A vehicle cab floor as claimed in Claim 1 or 2 wherein the trim effect includes an abrasion and slip resistant surface over that region of the floor normally accessible to the feet of a seated passenger in the vehicle.
4. A vehicle cab floor as claimed in Claim 2 or Claim 3 including a grit embedded in the said abrasion and slip resistant surface.
5. A vehicle cab floor as claimed in any preceding claim wherein the trim effect includes a decorative effect on a portion of the floor between two stepped portions of the floor which are adapted for mounting of seats thereon.
6. A vehicle cab floor as claimed in any preceding claim wherein at least part of the abrasion resistant surface comprises a layer of polyurethane.
7. A vehicle cab floor according to Claim 6 which comprises in the moulding the said layer of polyurethane and successive layers of synthetic fibre reinforced resin, polyurethane, and synthetic fibre reinforced resin.
8. A vehicle cab floor according to Claim 7 wherein the synthetic fibre reinforced resin includes molochite as a filler.
9. A vehicle cab floor according to any of Claims 6, 7 and 8 wherein the said layer of polyurethane is of dense closed cell formation.
10. A method of making a vehicle cab floor comprising the steps of applying a release agent to the exposed surfaces in a mould for the floor, followed, in succession, by a first layer of polyurethane, which provides an abrasion resistant upper surface of the moulded floor, a first layer of synthetic fibre reinforced resin, a second layer of polyurethane and a second layer of synthetic fibre reinforced resin and curing the resin, wherein at least one surface is provided in the mould at a desired location adapted to impart to the first

layer of polyurethane at that location a required surface trim effect as herein defined.

11. A method as claimed in Claim 7 wherein a textured lining is applied to the mould to define the surface which imparts the trim effect.

12. A method as claimed in Claim 10 or Claim 11 wherein the synthetic fibre reinforced resin includes molochite as a filler.

13. A vehicle cab having a floor as claimed in any one of Claims 1 to 9.

14. A vehicle cab having a floor made by the method as claimed in any of Claims 10 to 12.

15. A vehicle cab floor substantially as described herein with reference to the accompanying drawing.